

REMARKS

Applicant has amended the Claims 8 and 9. Applicant respectfully submits that these amendments to the claims are supported by the application as originally filed and do not contain any new matter. Accordingly, the Final Office Action will be discussed in terms of the claims as amended.

The Examiner has rejected the claims 8 and 9 under 35 U.S.C. 112, second paragraph, as being indefinite, stating that it is unclear how the diametrical ribs are located between the shaft-supporting portion and an innermost of the at least two circumferential ribs because Claims 1 and 3 respectively limit the diametrical ribs to extend from an innermost side of an outermost circumferential rib. In addition, it is the Examiner's opinion that Claims 8 and 9 are indefinite because it is unclear how a first number that represents only integer components can be substantially the same as a second number that similarly represents only integer components.

In reply thereto, Applicant would like to first point out that the claims should be read in light of the specification, and that Claims 8 and 9 are intended to claim a structure substantially as shown in Fig. 1 of the application. In the Fig. 1, which is shown in cross section in Fig. 2, there is a shaft supporting portion 4, an innermost circumferential rib 8, an outermost circumferential rib 10, and gear teeth 7 which are at the outermost periphery. In addition, there are diametrically extending ribs 11 between the shaft supporting portion 4 and the innermost circumferential rib 8, and radially extending diametrical ribs 12 between the innermost circumferential rib 8 and the outermost circumferential rib 10. Still further, the corrugated web is only provided between the outermost circumferential rib 10 and the gear teeth 7. Applicant further respectfully submits that the number of radially extending diametrical ribs 12 between the innermost circumferential rib 8 and the outermost circumferential rib 10 are provided in a certain number and the radially extending diametrical ribs 11 between the shaft supporting portion 4 and the innermost circumferential rib 8 are also provided in a particular number. By the Claims 8 and 9, Applicant has claimed that the existence of the radially extending diametrical ribs 11 and 12 in their respective locations and that the radially extending diametrical ribs 11 and 12 are provided in the same number or amount. In other words, and referring to Fig. 1, there are 16 radially extending diametrical ribs 12 provided between the outermost and innermost circumferential ribs 8 and 10, and there are 16 radially extending diametrical ribs 11 provided between the shaft supporting portion 4 and the innermost circumferential rib 8 and the number of ribs 11 and 12 are the same. Applicant respectfully submits that all of the structure described above is described in the specification of the present application and is further shown in the figures.

In view of the above, therefore, Applicant respectfully submits that reading the claims in light of the specification and considering the amendments to the Claims 8 and 9, that Claims 8 and 9 comply with the requirements of 35 U.S.C. 112, second paragraph, and they are now clear and definite.

The Examiner is further rejecting the Claims 1 and 3-6 under 35 U.S.C. 103 as being obvious Japanese 10-278124 in view of Williams, et al., stating that Japanese 124 discloses in figures 1a and 1b a plastic gear having teeth 3 on an annular portion thereof, a shaft supporting member 2, at least two circumferential ribs including a radially outermost circumferential rib 5 located outside of an intermediate point located between a rotational center of said gear and an outermost circumference of said gear and a radially innermost circumferential rib 6, a plurality of radially extending diametrical ribs 7 extending from an innermost side of said outermost annular rib toward said shaft supporting member, a plurality of radially extending diametrical ribs 8 extending between said innermost circumferential rib and said shaft supporting member, and a web portion 4 located between said outermost circumferential rib and said teeth, but does not disclose that the web portion would be corrugated; Williams, et al. teaches in Figs. 1 and 3 a plastic gear having a corrugated web portion wherein said web portion may comprise curvilinear, two-sided, or three-sided corrugations; and it would have been obvious to one of ordinary skill in the art that at the time of the invention was made to modify the apparatus of JP' 124 in view of Williams, et al. to form the web portion with corrugations to increase the axial strength of the gear without significantly increasing the required material construction.

In reply thereto, Applicant would like to first point out that in Applicant's invention are provided two areas which are reinforced in a different manner. In particular, there are the radially extending diametrical ribs which are provided between the shaft supporting portion and the innermost circumferential rib and between the innermost circumferential rib and the outermost circumferential rib. Still further, webs 5a, 5b, and 5c are provided between the shaft supporting portion 4 and the innermost circumferential rib 8, the innermost circumferential rib 8 and the outermost circumferential rib 10 and the outermost circumferential rib 10 and the teeth 7. There are no radially extending diametrical ribs provided between the outermost circumferential rib 10 and the gear teeth 7. There are no radially extending diametrical ribs provided in this portion because it is a "sensitive area" which is influential on the precision of the tooth portion when the gear is made. Accordingly, while the insensitive areas between the shaft supporting portion 4, innermost circumferential rib 8, and outermost circumferential rib 10 are provided with both radially extending

diametrical ribs 11 and 12 and webs 5a and 5b in order to reinforce this insensitive area, the sensitive area comprising the web 5c is reinforced by providing it in a corrugated form.

In view of the above, Applicant respectfully submits that Applicant's invention is not a mere combination of "the plastic gear having reinforcing ribs in the diametric and circumferential directions" and "a plastic gear in which the area between the rims and the hub are formed with waved webs." In other words, Applicant respectfully submits that Applicant's invention is for a plastic gear in which "in the areas which only a corrugated web is formed, a diametrical or circumferential ribs together with a non-corrugated web are not formed, and the areas in which only radially extending and circumferential ribs together with a plain web are formed, a corrugated web is not formed."

With the above in mind, Applicant respectfully submits that Williams, et al. only shows that the web as a whole is in a corrugated shape and does not show, suggest, or teach that the corrugated shape would be utilized in a gear having other areas wherein circumferential ribs and diametric ribs would be utilized. Williams, et al. merely suggests that the entire web of the gear would be corrugated, and that is not the case in Applicant's invention.

In addition to the above, therefore, Applicant respectfully submits that in Japanese'124, the number of radially extending diametrical ribs 8 between the shaft support portion and the innermost circumferential rib is substantially less than the number of radially extending diametrical ribs 7 which are provided between the innermost circumferential rib and the outermost circumferential rib.

Still further, Applicant respectfully submits that while the Examiner argues that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Japanese'124 to provide additional diametrical ribs between the shaft supporting portion and the innermost circumferential rib so as to increase the rigidity of the web therebetween, Applicant respectfully submits that none of the art cited by the Examiner in the prosecution of this Applicant shows such a construction, even though a rigid and precise gear which can be easily molded from plastic resin has been needed for a long time and has not been incorporated into any of the prior art cited by the Examiner. Applicant respectfully submits that such evidence or facts clearly indicate that it would not have been obvious to one of ordinary skill in the art.

In view of the above, therefore, Applicant respectfully submits that the Claims 1, 3-6, 8 and 9 are not obvious over Japanese'124 in view of Williams, et al.

The Examiner has further rejected the Claim 2 under 35 U.S.C. 103 as being obvious Japanese'124 in view of Williams, et al. and further in view of Mlenjnek, et al., stating that the combination of Japanese'124 and Williams, et al. shows each and every element of

Applicant's invention except for its utilization and an image forming device. Mlenjnek, et al. teaches in figure 4 a laser printer with a plastic gear 8; and it would have been obvious to one of ordinary skill in the art to modify the combination of Japanese'124 and Williams, et al. as suggested by Mlenjnek, et al.

In reply thereto, Applicant would like to incorporate by reference his comments above concerning Applicant's invention, Williams, et al. and Japanese'124. In addition, Applicant has carefully reviewed Mlenjnek, et al., and respectfully submits that while it may disclose a simple plastic gear in a laser printer, the plastic gear is not provided for any precision and the object of Mlenjnek, et al. is to provide a gear train structure which includes a plastic gear structure wherein the gear jitter or vibration of the plastic gear is reduced, and there is nothing in Mlenjnek, et al. to suggest any particular construction of a plastic gear which would increase its precision. Therefore, Applicant respectfully submits that one of ordinary skill in the art would not look to Mlenjnek, et al. and would not make the combination suggested by the Examiner.

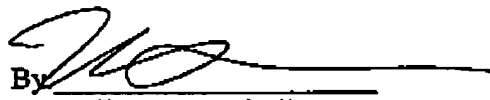
In view of the above, therefore, Applicant respectfully submits that the Claim 2 is not obvious over Japanese'124 in view of Williams, et al. and further in view of Mlenjnek, et al.

Applicant further respectfully and retroactively requests a one-month extension of time to respond to the Final Office Action, and respectfully requests that the one-month extension fee in the amount of \$120.00 be charged to KODA & ANDROLIA DEPOSIT ACCOUNT NO. 11-1445.

In view of the above, therefore, it is respectfully requested that this Rule 116 Amendment be entered, favorably considered and the case passed to issue.

Please charge any additional costs incurred by or in order to implement this Amendment or required by any requests for extensions of time to KODA & ANDROLIA DEPOSIT ACCOUNT NO. 11-1445.

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